

Abstract

Title: Selective functionalization of hydrocarbons with isolated oxygenases and mediator based regeneration

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Methods for preparative *in vitro* biocatalysis utilizing oxidoreductases. These methods are based on novel approaches to supply the oxidoreductases with reduction equivalents derived either from chemical or electrochemical sources. By utilization of organometallic mediators, the oxidoreductases are regenerated directly in the absence of nicotinamide coenzymes and biocatalysts generally used to transfer the reduction equivalents to the active site.

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These methods also include novel reactor design for continuous electrochemical regeneration of these enzymes.

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